

REAL-TIME TELEGUIDANCE OF A NON-SURGEON CREW MEDICAL OFFICER PERFORMING ORTHOPEDIC SURGERY AT THE AMUNDSEN-SCOTT SOUTH POLE STATION DURING WINTER-OVER.

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The Amundsen-Scott South Pole Research station located at the geographic South Pole, is the most isolated, permanently inhabited human outpost on Earth. Medical care is provided to station personnel by a non-surgeon crew medical officer (CMO). During the winter-over period from February to October, the station is isolated, with no incoming or outgoing flights due to severe weather conditions.

In late June, four months after the station had closed for the austral winter, a 31 year old meteorologist suffered a complete rupture of his patellar tendon while sliding down an embankment. An evacuation was deemed to be too risky to aircrews due to the extreme cold and darkness. A panel of physicians from Massachusetts General Hospital, Johns Hopkins University and the University of Texas Medical Branch were able to assess the patient remotely via telemedicine and agreed that surgery was the only means to restore mobility and prevent long term disability.

The lack of a surgical facility and a trained surgical team were overcome by conversion of the clinic treatment area, and intensive preparation of medical laypersons as surgical assistants. The non-surgeon CMO and CMO assistant at South Pole, were guided through the administration of spinal anesthetic, and the two-hour operative repair by medical consultants at Massachusetts General Hospital. Real-time video of the operative field, directions from the remote consultants and audio communication were provided by videoconferencing equipment, operative cameras, and high bandwidth satellite communications. In real-time, opening incision/exposure, tendon relocation, hemostasis, and operative closure by the CMO was closely monitored and guided and by the remote consultants. The patient's subsequent physical rehabilitation over the ensuing months of isolation was also monitored remotely via telemedicine. This was the first time in South Pole's history that remote teleguidance had been used for surgery and represents a model for real-time guidance of CMO's working at remote duty stations.